

12 February 2004

Serial No.: 09/802,420

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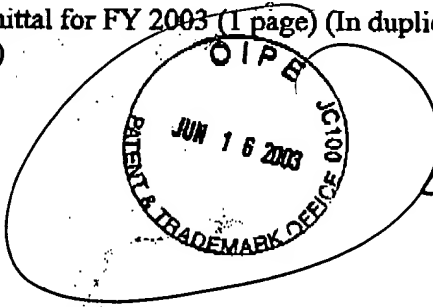
Appeal Brief

Applicant: Raymond G. Blair et al. S.D.W.
Filed: 09 March 2001
Title: Ablative Method for Forming RF Ceramic Block Filters

Enclosures:

PTO/SB/17 Fee Transmittal for FY 2003 (1 page) (In duplicate)
Appeal Brief (10 pages)
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Docket No.: WC0001D-A
Mailed: 11 June 2003



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**In The United States Patent And
Trademark Office**

Applicant: Raymond G. Blair et al.

Art Unit: 3729

Serial No.: 09/802,420

Attorney Docket: WC0001D-A

Filed: 9 March 2001

Appeal No. _____

For: Ablative Method For Forming
RF Ceramic Block Filters

Examiner: Alan M. Boswell

FAX RECEIVED**APPEAL BRIEF**

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Sir:

Applicants appeal the final rejection of claims 27-38 in the identified application.

1. Real Party In Interest

The real party in interest is CTS Corporation (NYSE:CTS).

2. Status of Claims

Claims 27-38 are on appeal, all of which were added during prosecution.

Original claims 1-26 have been cancelled.

The claims on appeal are set forth in the Appendix hereto for ready reference.

**3. Status of All Amendments Filed
Subsequent to Final Rejection**

No amendments have been filed since the final rejection.

4. Summary of the Invention

The claimed invention pertains to methods for manufacturing communication signal filters using a shaped and metallized block of ceramic. The claimed manufacturing methods relate to using laser ablation of a fully metallized ceramic block such that the laser treated unmetallized areas are recessed into the ceramic block.

5. Statement of All Issues Presented For Review

The following issues are presented for review:

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I. Would claim 27 have been obvious to one of ordinary skill in the pertinent art [35 U.S.C. §103] at the time the claimed invention was made in view of the teachings of U.S. Patent No. 6,081,174 to Takei et al. (the "Takei patent").

II. Would claims 28-37 have been obvious to one of ordinary skill in the pertinent art [35 U.S.C. §103] at the time the claimed invention was made in view of the teachings of the Takei patent when combined with the teachings of U.S. Patent No. 6,154,106 to De Lillo (the "De Lillo patent").

III. Would claim 38 have been obvious to one of ordinary skill in the pertinent art [35 U.S.C. §103] at the time the claimed invention was made in view of the teachings of the Takei patent when combined with the teachings of the De Lillo patent and U.S. Patent No. 5,512,866 to Vangala et al. (the "Vangala patent")

6. Grouping of the Claims for Each Ground of Rejection

Except for claims 28 and 33 which can be grouped together, the rejected claims do not stand or fall together. All of the claims on appeal have been rejected under 35 U.S.C. §103.

Claim 27 defines a method of manufacturing a signal filter by using ablation on a specially shaped and metal coated ceramic block to form a pattern of metallized and unmetallized areas on the block. The ablation is completed such that the unmetallized areas are recessed into the block.

Claims 28-32 are dependent on claim 1 and define specific embodiments of the invention. Claims 28 and 29 further require a second heat treatment, and in particular, a heat treatment of the patterned block. Claim 30 further defines the type of metallization as based on a silver paste. Claims 31 and 32 further require that the ablative etching be carried out using a laser.

Claim 33 defines a method of manufacturing a signal filter including heat treating after patterning. The patterned block is formed by selective ablation of a heat treated, metal encased block.

Claims 34-36 are dependent on claim 1 and define specific embodiments of the invention. Claims 34 and 36 require that the ablative etching be carried out using a laser. Claim 35 requires that in the second heating step the patterned block be raised to a temperature sufficient to improve filter (signal) insertion loss.

Claim 37 defines a method of manufacturing a signal filter by using laser ablation

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on a specially shaped and metal encased ceramic block to form a pattern of metallized and unmetallized areas on the block followed by heat treatment of the patterned block.

Claim 38 defines a method of manufacturing a batch of duplexer signal filters by using laser ablation on specially shaped and metal coated ceramic blocks to form a pattern of metallized and unmetallized areas on each block, and using heat treatment of the patterned block.

7. Argument

(a) None of the Rejections Present A *Prima Facie* Case of Obviousness.

The appellants' inventive efforts in this case are in the field of monoblock ceramic signal filters. In particular, the invention is directed to a method of preparing monoblock filters by coating surfaces of a specially shaped ceramic block with a conductor and ablatively etching a selected portion of the coated surface such that the resulting unmetallized areas are recessed into the ceramic monoblock.

All of the pending claims are rejected as obvious (35 U.S.C. §103), and the principal reference for all the rejections is the Takei patent. The Takei patent does not teach or suggest carrying out the ablative etching such that the unmetallized areas are recessed into the block ceramic material.

The Takei patent includes a sentence referring to using a laser to remove coatings (7:34-39), but neither suggests nor implies using laser irradiation to create recessed unmetallized areas. The Examiner incorrectly concluded that the Takei patent somehow associates any recessed areas to ablation (26 March Final Office Action, Paper No.13, p. 3, lines 3-4, p. 5, lines 7-10). First, the Takei feature - 43a identified by the Examiner as a recess is, instead, a hole (See Takei patent FIG. 27). If Takei et al. do show any features that could properly be labeled a "recess" into the ceramic, the best candidates are the various levels shown on FIG. 37 and numbered 50a and 50b. The Takei patent labels features 50a and 50b as "depressions" (15:7-15), possibly implying that these features are molded. The depressions 50a and 50b bear metallization 7a and 7b, respectively. Depressions 50a and 50b are, therefore, not unmetallized areas as called for in the present claims.

It is possible that the Takei patent was identified by keyword searching for the term "recess." The Takei patent uses the term "recess" in several places in reference to the two-dimensional layout of the metal coating. For example, at 12:59-60, the Takei

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patent refers to recesses 40a and 40b in FIG. 27. These features 40a and 40b are clearly a reference to two-dimensional locations on the flat, level surface of the dielectric body. In contrast, the present claims call for a "recess" into the block.

In rejecting claims under 35 U.S.C. §103, the Examiner bears the initial burden of presenting a *prima facie* case of obviousness. See *In re Rijckaert*, 9 F.3d 1531, 28 U.S.P.Q.2d 1955 (Fed. Cir. 1993); *In re Oetiker*, 977 F.2d 1443, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). A *prima facie* case of obviousness is established when the teachings of the prior art itself would appear to have suggested the claimed subject matter to one of ordinary skill in the art. See *In re Bell*, 991 F.2d 781, 26 U.S.P.Q.2d 1529 (Fed. Cir. 1993); *In re Rinehart*, 531 F.2d 1048, 189 U.S.P.Q. 143 (C.C.P.A. 1976). This is not to say, however, that the claimed invention must expressly be suggested in any one of, or all of, the references. Rather, the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. See *Cable Electric Products, Inc. v. Genmark, Inc.*, 770 F.2d 1015, 226 U.S.P.Q. 881 (Fed. Cir. 1985); *In re Kaslow*, 707 F.2d 1366, 217 U.S.P.Q. 1089 (Fed. Cir. 1983); *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871 (C.C.P.A. 1981). Here the Examiner has not presented a *prima facie* case of obviousness.

The claimed invention must be considered as a whole. In determining obviousness it is not relevant that some or all aspects of the claim may have been otherwise known in the art. *Jones v. Hardy*, 220 U.S.P.Q. 1021 (Fed. Cir. 1984). While a reference may be utilized for all that it teaches, focusing upon isolated portions of the reference or picking and choosing only that which supports a holding of obviousness is improper. Pertinent in this regard also are the cases of *Panduit Corp. v. Dennison Mfg. Co.*, 1 U.S.P.Q.2d 1593, 1602 (Fed. Cir. 1987), and *In re Wesslau*, 147 U.S.P.Q. 391 (C.C.P.A. 1965). Accordingly, the very limited and cursory discussion of device fabrication present in the Takei patent does not warrant a liberal extension to undisclosed features. Indeed, the single paragraph surrounding the five-line passage of the Takei patent cited by the Examiner (i.e., 7:35-39) is the only portion of the Takei patent discussing dielectric body fabrication.

(b) Claim 27 Would Not Have Been Obvious to
One of Ordinary Skill in View of the Takei Patent.

The method of Claim 27 requires the use of ablation on a specially shaped and

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conductor coated ceramic block to form a pattern of metallized and unmetallized areas on the block. Claim 27 further requires that the step of ablatively etching creates unmetallized areas that are recessed into the block.

The Takei patent does not teach or suggest forming filters by ablative etching to create unmetallized areas recessed into the block of ceramic material. To the extent the Takei patent can even be read to include recessed areas, there is no discussion of how such areas are formed. The Takei patent uses the term "depressions" to describe dielectric body contours, a reference which suggests such features are molded into the body (15:7-15).

The logical transition from the teachings of Takei et al. to the presently claimed method is lacking — such transition cannot be found within the four corners of this reference even by inference. The rejection of claim 27 should not be sustained.

(c) Claims 28 and 33 Are Indeed Patentable Over the Applied References.

Claims 28 and 33 each define a method for making a signal filter including ablative etching of a heat treated, coated block followed by a second heat treatment of the patterned block. The rejection of claims 28 and 33 on the basis of the Takei patent in view of the De Lillo patent is clearly unwarranted.

Both claims 28 and 33 call for ablation to form unmetallized areas recessed into the block. Both claims 28 and 33 also call for forming a pattern of metallized and unmetallized areas on the block. As noted above, the Takei patent fails to teach or suggest this feature. The De Lillo patent offers nothing to cure this critical defect in the primary reference.

The Examiner's contention that the De Lillo patent "teaches the step of heat-treating the patterned block..." is also not supportable (26 March Office Action, Paper No.13, p. 3, lines 14-15). The teachings of De Lillo et al. are neither the same nor analogous to the presently claimed methods. The De Lillo patent concerns the processing of a nine-layer multi-material subassembly. At 9:40-43, De Lillo teaches using nine layers of R03010 (Rogers Corporation). R03010 material is a ceramic-filled PTFE composite. The PTFE-composite construction is confirmed at 5:35. The nine-layer plastic-with-ceramic subassembly of the De Lillo patent cannot be described as a ceramic block.

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Indeed, in Paper 13, the Examiner cites a passage of the De Lillo patent (at 10:1-4) that concerns heating not a block filter, but instead a lamination subassembly. A complete review of the De Lillo patent reveals a process that includes dozens of heating steps overall and multiple heating steps for each layer. Each layer is separately processed, multilayer subassemblies are separately processed and finally a complete laminate is plated and reprocessed.

The multi-material and several-layer constructions of the De Lillo patent relate neither to the present invention nor the Takei patent. Even if one accepts for the purpose of argument that the De Lillo patent is somehow related to either the Takei patent or the claimed invention, the De Lillo patent calls for so many different heating steps that it is unreasonable to select only one for application against the present claims.

For the same reasons that the De Lillo patent does not suggest the claimed heating step, the De Lillo patent is also not properly combinable with the Takei patent. The functional and structural elements of the De Lillo multilayer assembly are entirely different and are not combinable with the elements of the Takei filter. It has long been recognized that references are not properly combinable where none of the cited references suggests the desirability of the inventive combination. See *Application of Imperator*, 179 U.S.P.Q. 730 (C.C.P.A. 1973) cited by the C.A.F.C. for the same proposition in the cases of *In re Sernaker*, 217 U.S.P.Q. 1 (1983) and *In re Gordon*, 221 U.S.P.Q. 1125 (1984). One of ordinary skill could not have found any motivation within the four corners of either of these references for the combination.

(d) Claim 29 Is Patentable Over the Applied References.

Claim 29 defines a method for making a signal filter including ablative etching of a heat treated, coated block followed by a second heat treatment of the patterned block wherein the second heat treatment includes heating to a temperature sufficient to reduce filter insertion loss. Claim 29 is patentable over the Takei and De Lillo patent combination for the reasons noted above, and also because neither reference makes any connection between a desired heat treatment temperature and insertion loss.

(e) Claims 30-32 Are Patentable Over the Applied References.

Claims 30-32 are dependent on claim 27 and rejected as obvious based on the combination of the Takei patent in view of the De Lillo patent. Although the Examiner

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grouped the rejection of claims 30-32 with the Takei-De Lillo patent combination, the Final Office Action appears to rely only on the Takei patent (26 March Office Action, Paper No.13, p. 3, lines 9-22, 19-20 and p. 4, lines 1-3). Claims 30-32 are dependent on claim 27 and patentable over the Takei-De Lillo patent combination for the reasons noted above.

(f) Claims 34-36 Are Patentable Over the Applied References.

Claims 34-36 are dependent on claim 33 and rejected as obvious based on the combination of the Takei patent in view of the De Lillo patent. Claims 34-36 are patentable over the Takei-De Lillo patent combination for the reasons noted above. Neither patent reference teaches forming a pattern of metallized and unmetallized areas recessed into the block, and the De Lillo patent fails to suggest the post-ablation heating step as required by these claims.

(g) Claim 37 Is Patentable Over the Applied References.

Claim 37 defines a method of manufacturing a signal filter by using laser ablation on a specially shaped and coated ceramic block to form a pattern of metallized and unmetallized areas on the block, followed by heat treatment of the patterned block. The rejection of claim 37 based on the combination of the Takei patent in view of the De Lillo patent is not sustainable for the reasons presented above. Neither patent reference teaches forming a pattern of metallized and unmetallized areas with a laser such that unmetallized areas are recessed into block. The references also fail to suggest the post-ablation heating step as required by these claims.

(h) Claim 38 Is Patentable Over the Applied References.

Claim 38 defines a method of manufacturing a batch of signal filters using the steps described above, but also requiring a pattern of metallized and unmetallized areas that include a transmitter pad, an antenna pad and a receiver pad. Claim 38 reflects that the present invention is specially suited for creating complicated filters in high volumes. Claim 38 is rejected as obvious on the basis of the Takei patent in view of the De Lillo patent and in further view of U.S. Patent No. 5,512,866 to Vangala et al. The Vangala patent is cited to show the transmitter, antenna and receiver pad features. The Vangala patent does not cure any of the defects of the primary Takei patent reference discussed above, however. Furthermore, the Vangala patent does not discuss steps for

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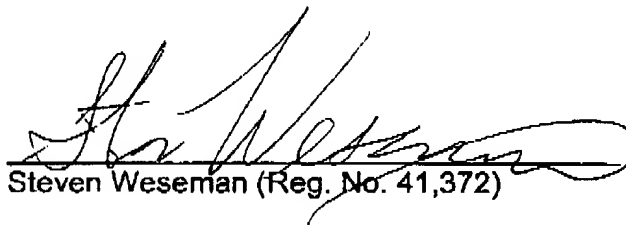
higher volume manufacturing as defined in claim 38. The pending rejection of claim 38 is accordingly not sustainable.

8. Conclusion

The applied references do not make out a *prima facie* case of obviousness with respect to any of the claims on appeal. Accordingly, the present rejection of all claims is not sustainable.

Reversal of the rejection is believed to be in order.

Respectfully Submitted,

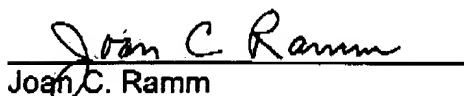


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CERTIFICATE OF MAILING

I hereby certify that this APPEAL BRIEF is being deposited with the United States Postal Service as first class mail on 11 June 2003 in an envelope addressed to Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



Joan C. Ramm

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Appeal Brief Appendix

The Claims On Appeal – Serial No. 09/802,420

27. A method of manufacturing an RF ceramic filter comprising the steps of:
forming a block of ceramic material having an outer surface with at least one pair of opposing sides and defining a plurality of through holes extending between the opposing sides;

covering the block with a conductive coating;

heat treating the coated block; and

ablatively etching a selected area of the heat-treated coated block to form a pattern of metallized and unmetallized areas on the block,
wherein the step of ablatively etching is carried out such that the unmetallized areas are recessed into the block of ceramic material.

28. The method according to claim 27 further comprising the step of heat treating the patterned block.

29. The method according to claim 27 further comprising the step of heat treating the patterned block to a temperature sufficient to reduce the filter insertion loss.

30. The method according to claim 27 wherein the step of covering the block with a conductive coating includes contacting the block with a silver paste.

31. The method according to claim 27 wherein the step of ablatively etching the block is carried out using a laser beam.

32. The method according to claim 27 wherein the step of ablatively etching the block is carried out using a scanning laser.

33. A method of manufacturing an RF ceramic filter comprising the steps of:
providing a ceramic block having an outer surface with at least one pair of opposing sides and defining a plurality of through holes extending between the opposing sides;

encasing the block with a conductive coating;

heat treating the coated block;

ablatively etching the conductive coating and a portion of the ceramic block from selected areas of the heat-treated coated block to form a pattern of metallized and

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unmetallized recessed areas on the block; and
heat treating the patterned block.

34. The method according to claim 33 wherein the step of ablatively etching the block is carried out using a scanning laser.

35. The method according to claim 33 further comprising the step of heat treating the patterned block to a temperature sufficient to reduce the filter insertion loss.

36. The method according to claim 33 wherein the step of ablatively etching the block is carried out using a laser beam.

37. A method of manufacturing an RF ceramic filter comprising the steps of:
providing a block of ceramic material;
encasing the block with a conductive coating;
heat treating the coated block;
ablatively etching with a laser selected areas of the heat-treated coated block to form a pattern of unmetallized recessed areas and unablated metallized areas on the block; and

heat treating the patterned block.

38 (amended). A method of manufacturing an RF ceramic filter comprising the steps of:

(a) providing a ceramic block having an outer surface with at least one pair of opposing sides and defining a plurality of through holes extending between the opposing sides;

(b) encasing the block with a conductive coating;

(c) heat treating the coated block;

(d) ablatively etching with a laser the conductive metal coating and a portion of the ceramic block from selected areas of the heat-treated coated block to form a pattern of metallized and unmetallized recessed areas on the block,

wherein the pattern of metallized and unmetallized recessed areas includes a transmitter pad, an antenna pad and a receiver pad;

repeating steps (a) through (d) to make a plurality of patterned blocks and thereafter heat treating the plurality of patterned blocks.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Raymond G. Blair et al.

Serial No.: 09/802,420

Filed: 9 March 2001

Entitled: Ablative Method for Forming
RF Ceramic Block Filters

Examiner: Anthony D. Tugbang

Art Unit: 3729

Attorney Docket: WC0001D-A

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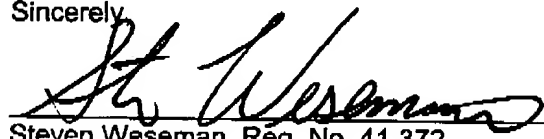
This communication is submitted in response to a telephone conversation today with Examiner Tugbang in which Examiner Tugbang reported that a Notice of Appeal was received in the subject application, but not the Appeal Brief.

Transmitted with this cover is a true and correct copy of:

- the Appeal Brief (mailed 11 June 2003), and
- the return receipt postcard identifying the Appeal Brief and bearing the USPTO receipt dated 16 June 2003

Applicants' representative has confirmed corresponding debits to the Deposit Account of the assignee of record (#03-1677); namely, \$320 debited on 17 June 2003 and \$320 debited on 18 June 2003, both for Docket No. WC0001D-A.

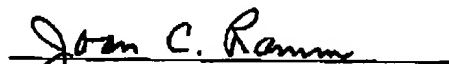
Sincerely,


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Joan C. Ramm